

Net Metering

Farm



Industry



Business



Residential



Schools



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Agenda

- Metering
- Billing
- Interconnection agreements
- Policies
- What are the issues?
- Trends
- Net metering in Kansas
- Net metering in surrounding states

Different Sizes for Different Applications



Small (≤ 10 kW)

- Homes
- Farms
- Remote Applications

(e.g. water pumping, telecom sites, icemaking)



Intermediate (10-250 kW)

- Village Power
- Hybrid Systems
- Distributed Power



Large (660 kW - 2+MW)

- Central Station Wind Farms
- Distributed Power

Net Metering Policy

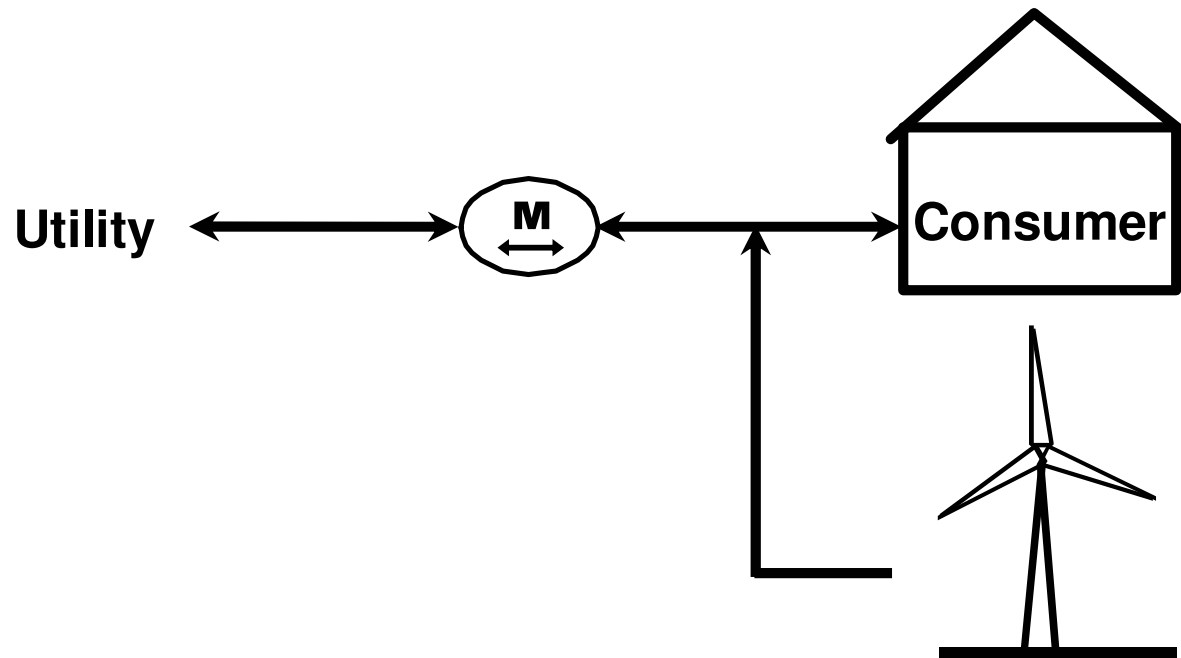
- Nationally, utilities are required to allow interconnection and buy power generated
 - Oversight of IOUs only
 - States and PUCs can determine rules and rates



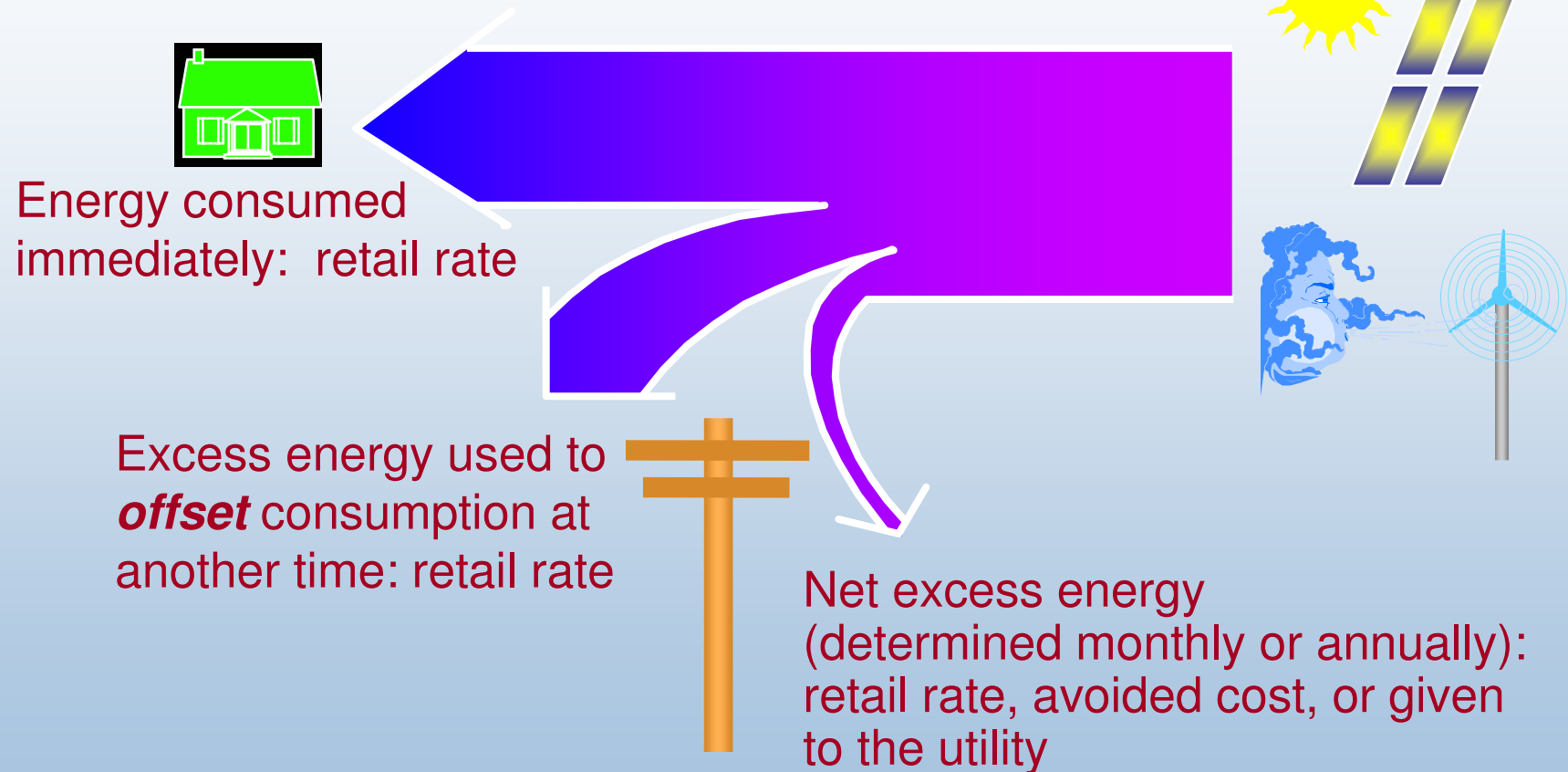
So, how does it work?

Meter Configuration For Net Metering

One meters, one rate.
“Net” refers to net kWhs.
(meter = kWhs)

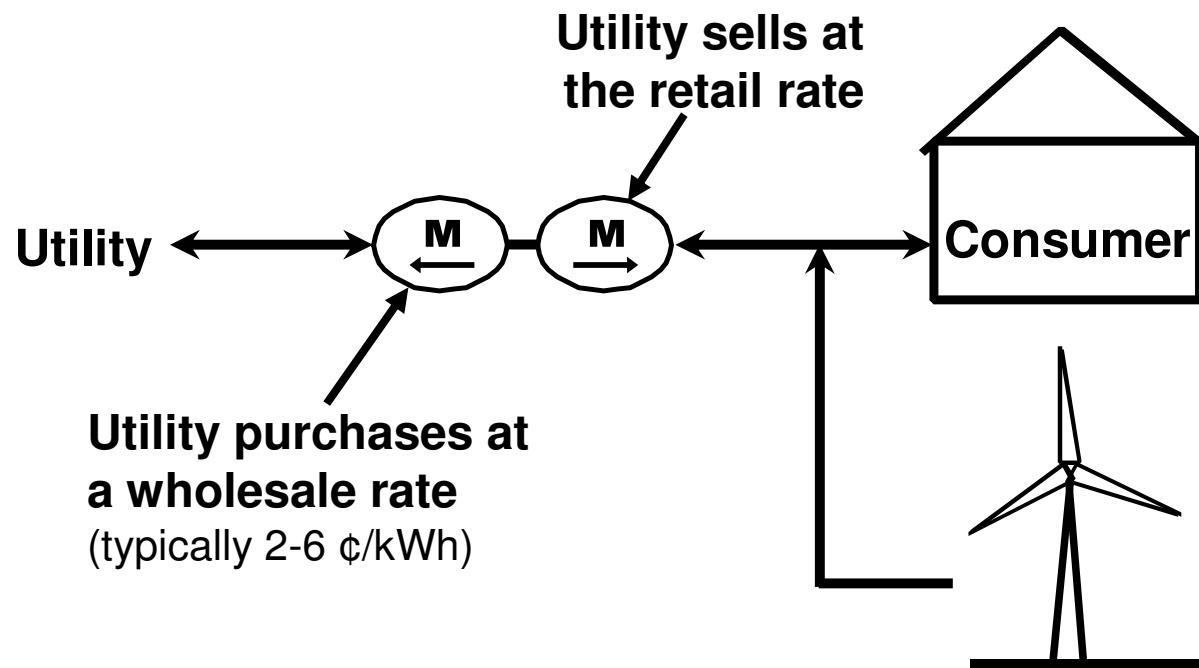


Net Metering of Renewable Energy



Meter Configuration For Net Billing

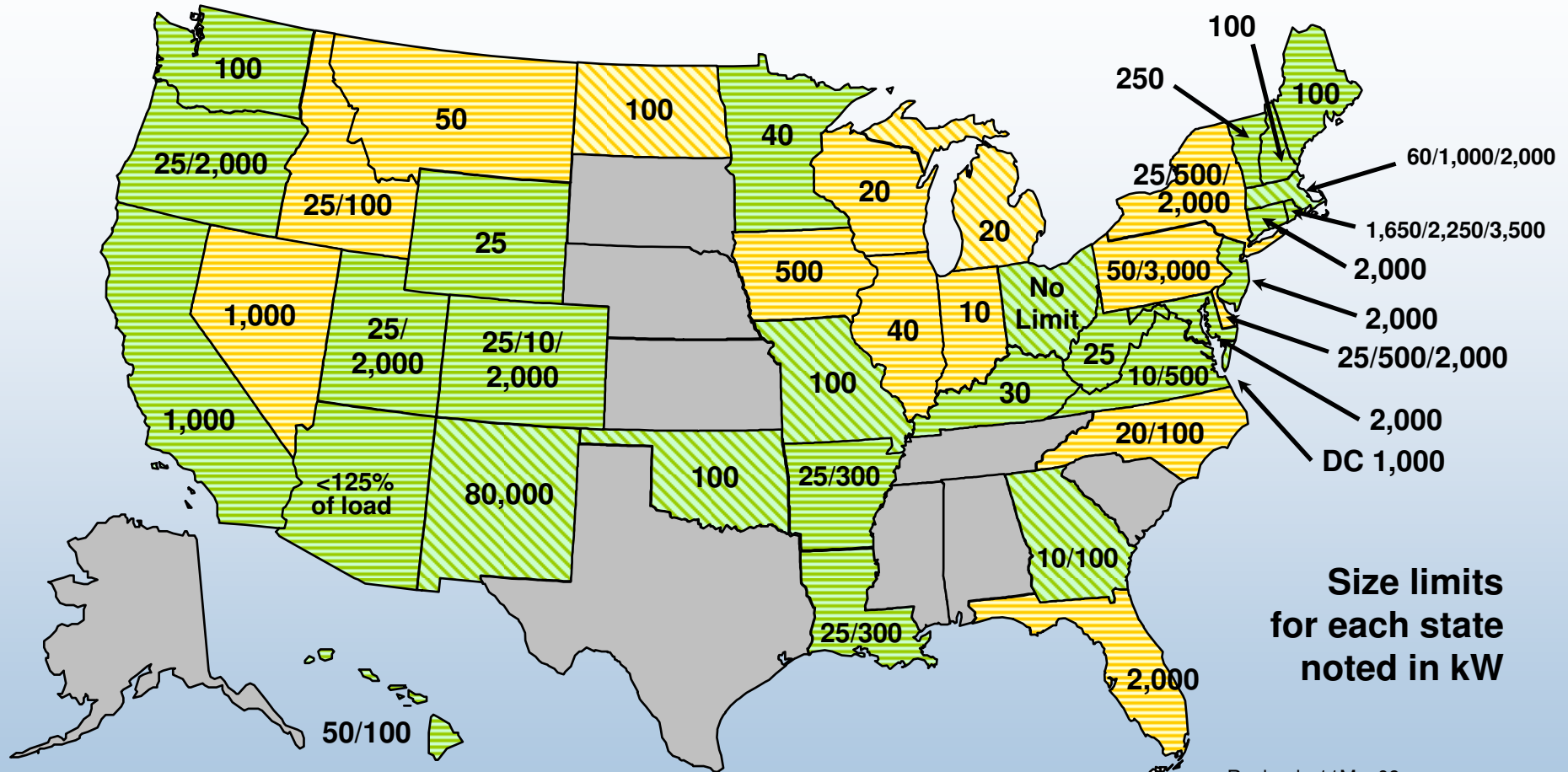
Two meters, two rates.
“Net” refers to net \$.
(billing = \$)



Net Metering for Wind



27 states have net metering for all rural consumers



Treatment of Net Excess Energy:



Monthly



Annual, or monthly @ retail rate



Varies by utility



None



Individual Utilities



Investor-Owned Utilities Only, Not Rural Cooperatives



Investor-Owned Utilities and Rural Cooperatives

Revised: 11May09

Source: www.dsireusa.org

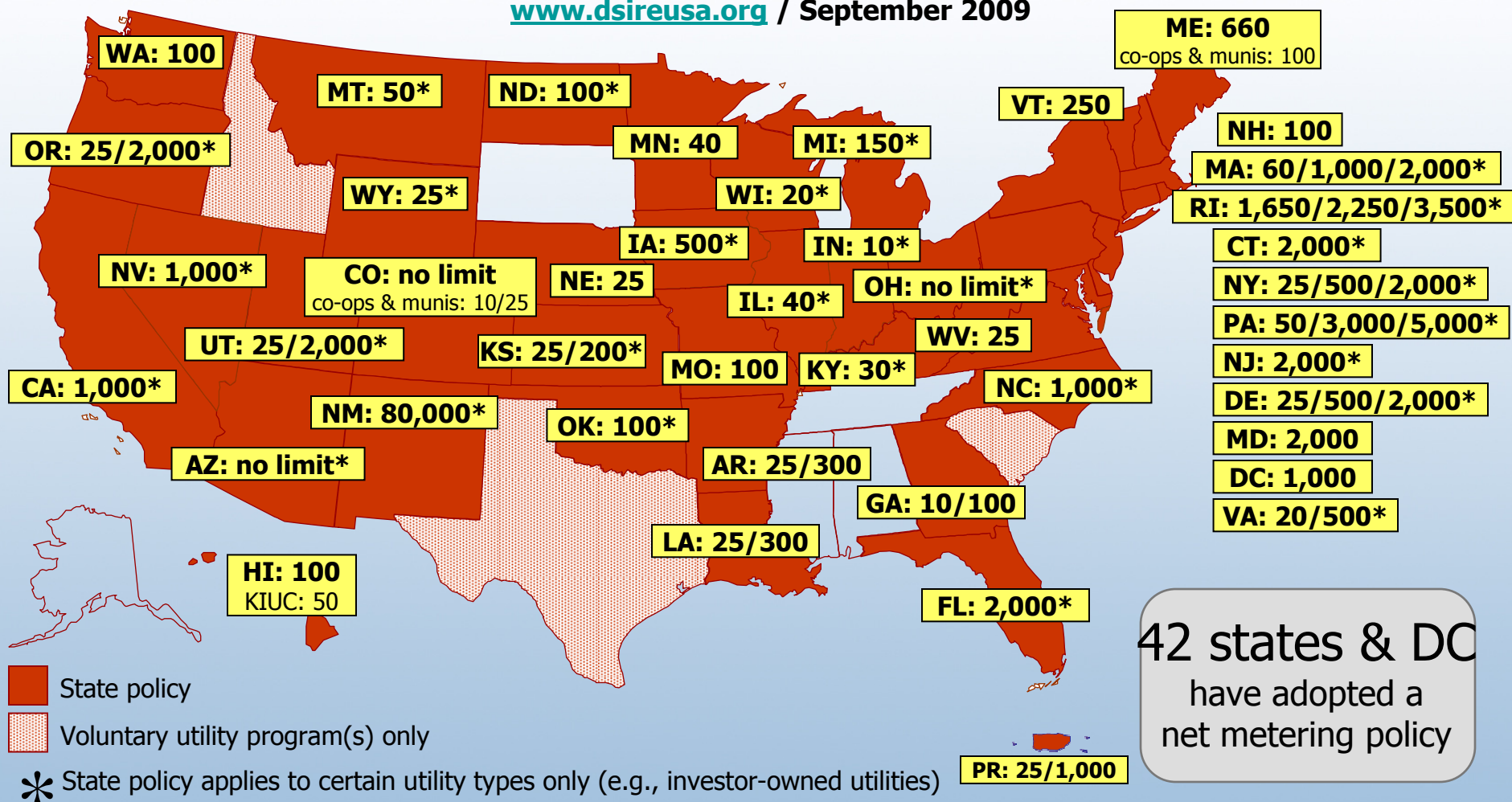


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Innovation for Our Energy Future

Net Metering

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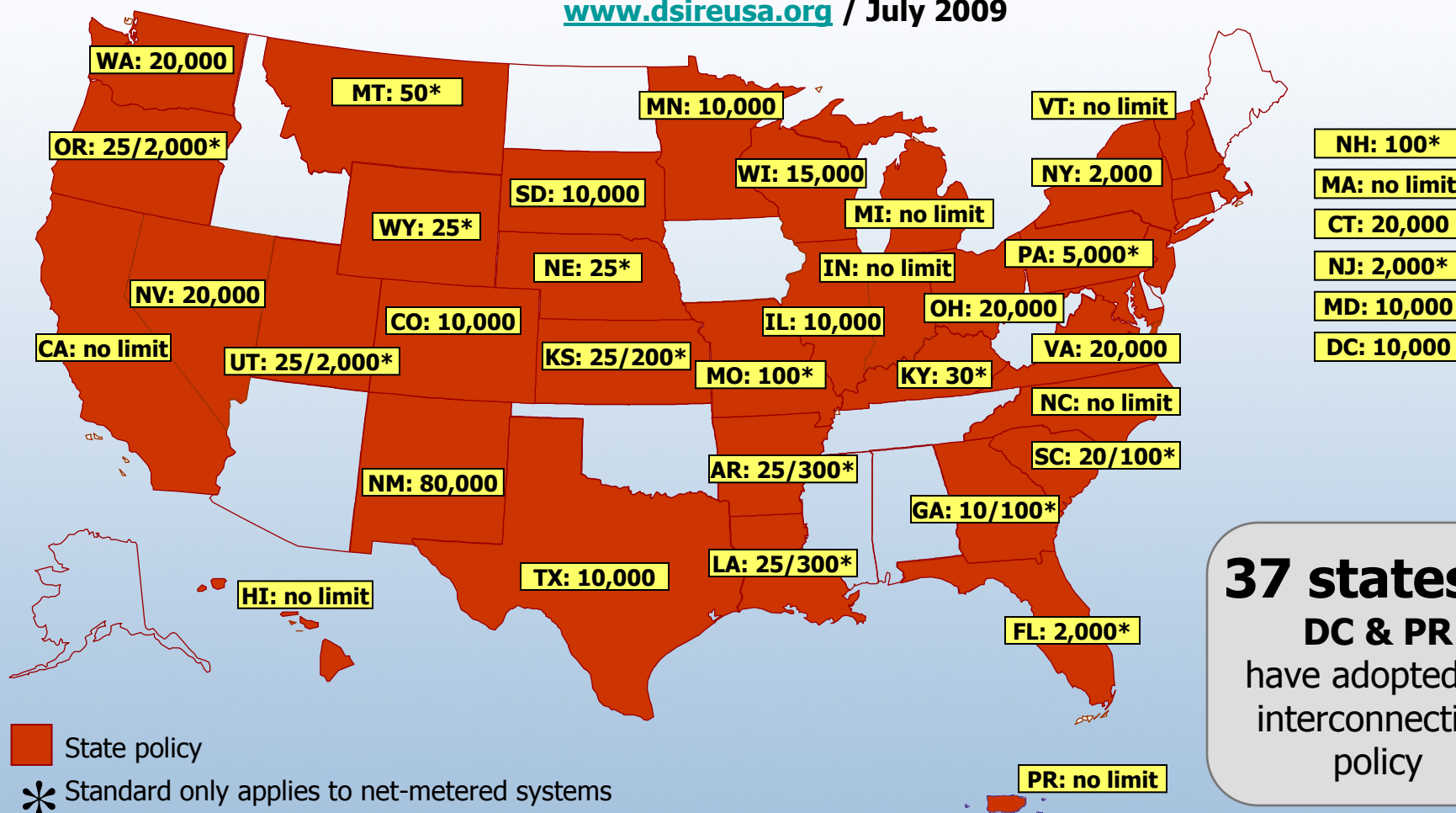
Note: Numbers indicate system capacity limit in kW. Some state limits vary by customer type, technology and/or system application. Other limits might also apply.



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Interconnection Standards

www.dsireusa.org / July 2009



**37 states +
DC & PR**
have adopted an
interconnection
policy

Notes: Numbers indicate system capacity limit in kW. Some state limits vary by customer type (e.g., residential/non-residential). "No limit" means that there is no stated maximum size for individual systems. Other limits may apply. Generally, state interconnection standards apply only to investor-owned utilities.



Interconnection Agreement (contract)

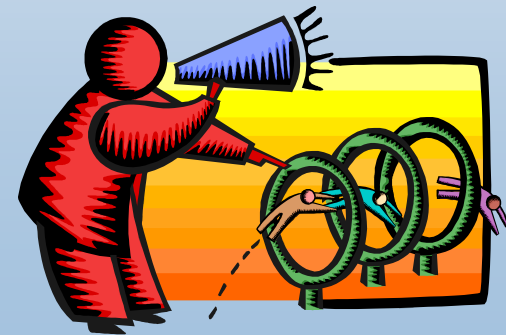
- Document needed to interconnect your solar/wind systems to utility grid
- Vary in length and complexity
- Covers a variety of things
 - Location of DG,
 - Disconnection requirements
 - Insurance and liability
 - Inspection and testing
 - Typically references tariffs for billing & payment
- Xcel Interconnection Agreement
 - <http://www.xcelenergy.com/docs/retail/conmrkts/InterconnectionAgreement.pdf> - interconnection agreement

What are the issues?

- Which utilities participate?
- Is there a system capacity limit?
- Is there an aggregate capacity limit?
- What is the period of true up? Monthly? Annual?
- What happens to net excess generation? Retail? Avoided cost? Given back to the utility?
- What is the price of a kwh?
- Who owns the RECs?
- System fees or required purchases (e.g. meters, insurance)?
- Incentives, buydowns, or anything else that affects the payback period?

Steps to Implement a Small Wind Project

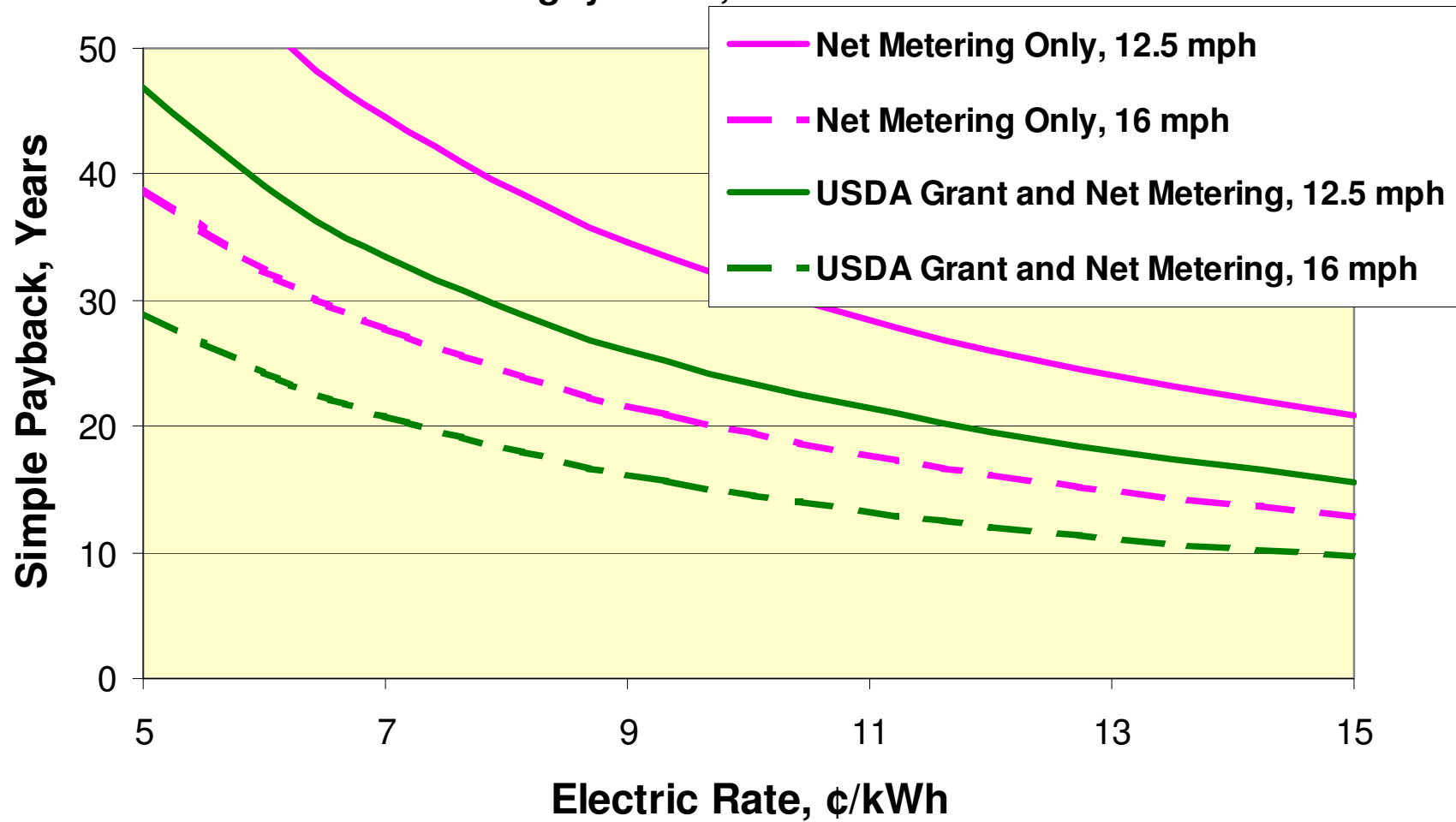
1. Assess your electricity consumption, cost, and utility tariff
2. Wind resource & micro-siting
3. Select turbine size (model) and tower height
4. Incentives & economics
5. Zoning (including neighbor notification)
6. Utility interconnection agreement
7. Building permit
8. Order turbine and tower
9. Installation
10. Commissioning



Small Wind Economics

Bergey Excel on 100ft Tower

Simple Payback
Bergey Excel, 100 ft Tower



Trends

- Higher ceilings (size of turbine or percentage of load)
- Annual or longer net billing (rather than monthly or shorter)
- No differential ceilings for residential and industrial
- Increase in numbers of municipal and rural electric cooperatives with net metering policies
- Net metering allowing aggregation of electric meters (VT, proposed in MA)
- MI & WI – net metering at retail rate
- Proposed feed-in tariffs
- Minimization of other costs with experience
 - Liability insurance
 - Meter expenses
 - Interconnection fees

Kansas Net Metering



- **Applicable Utilities:** Investor-owned utilities
- **System Capacity Limit:** 200 kW for non-residential; 25 kW for residential though systems should be appropriately sized so as not to exceed expected load.
- **Aggregate Capacity Limit:** 1% of utility's peak demand during previous year
- **Net Excess Generation:** Credited to customer's next bill at retail rate; granted to utility at end of 12-month billing cycle
- **REC Ownership:** Utility owns RECs
- **Date Enacted:** 5/22/2009
- **Special Utility Provisions:**
 - Utilities are required to provide net-metered customers with a bi-directional meter at no cost to the customer.
 - Utilities are also prohibited from charging net-metered customers any additional standby charges, capacity charges, interconnection charges or other fees that a customers would not incur if the customer did not participate in net metering.
 - The estimated generating capacity of all net-metered systems may count towards the utility's renewable capacity requirement under Kansas's renewable portfolio standard (RPS).
 - Utilities may require an external disconnect switch though they may not require customers purchase additional insurance.

Colorado Net Metering

- **Applicable Utilities:** All utilities (exceptions for small municipal utilities)
- **System Capacity Limit:** IOU customers: 120% of the customer's average annual consumption. Muni and co-op customers: 25 kW for non-residential & 10 kW for residential
- **Aggregate Capacity Limit:** No limit specified
- **Net Excess Generation:** Credited to customer's next bill at retail rate. IOUs pay customers at end of calendar year at average hourly incremental cost, or customer may opt for indefinite roll-over. Munis and co-ops provide annual reconciliation at a rate they deem appropriate.
- **REC Ownership:** Customer owns RECs (must be relinquished to utility for 20 years in exchange for incentives)
- **Date Enacted:** 9/2/2009 (last update)
- **If a customer-generator does not own a single bi-directional meter, then the utility must provide one free of charge.**
- **Systems over 10 kilowatts (kW) in capacity require a second meter to measure the output for the counting of renewable-energy credits (RECs)**



Missouri Net Metering

- **Applicable Utilities:** All utilities
- **System Capacity Limit:** 100 kW
- **Aggregate Capacity Limit:** 5% of utility's single-hour peak load during previous year
- **Net Excess Generation:** Credited to customer's next bill at avoided-cost rate; granted to utility at end of 12-month period
- **REC Ownership:** Not addressed
- **Date Enacted:** 06/19/2009 (last update)
- **Systems must be intended primarily to offset part or all of a customer's own electricity requirements.**
- **The recent revision to rules remove all liability insurance requirements for systems up to 10 kW and reduce the minimum insurance requirement for systems larger than 10 kW from \$1 million to \$100,000.**

Nebraska Net Metering

- Applicable Utilities: All utilities
- System Capacity Limit: 25 kW
- Aggregate Capacity Limit: 1% of utility's average monthly peak demand
- Net Excess Generation: Credited to customer's next bill at avoided-cost rate; excess reconciled at end of annual period
- REC Ownership: Customer owns RECs
- Date Enacted: 5/13/2009
- No discussion of costs/requirements for meters or any of the other common barriers that are used to decrease acceptance of the regulation.

Oklahoma Net Metering



- Applicable Utilities: Investor-owned utilities, regulated electric cooperatives
- System Capacity Limit: 100 kW or 25,000 kWh/year (whichever is less)
- Aggregate Capacity Limit: No limit specified
- Net Excess Generation: Credited to customer's next bill or granted to utility monthly (varies by utility)
- REC Ownership: Not addressed
- Date Enacted: 5/23/1988
- Utilities are not allowed to impose extra charges for customers signed up for net metering, nor are they allowed to require new liability insurance as a condition for interconnection. Utilities are also not required to purchase net excess generation (NEG) from customers. However, a customer may request that the utility purchase NEG. In the utility agrees, then NEG will be purchased at the utility's avoided-cost rate.